

【CLAIMS】**【Claim 1】**

A differentiation regulating agent, which regulates differentiation from stem cells into natural killer cells, containing one or more genes, as an effective ingredient, selected from a group consisting of homeobox protein MIX (AF15457), pre-pro-proteinase 3 (U97073), myeloblastosis (Myb) oncogene (M16499), keratin complex 1, acidic, gene 13 (NM_010662), PA-phosphatase related phosphoesterase (AK002966), gamma-parvin (BC011200), forkhead-related transcription factor 1C (AF330105), RIKEN cDNA 5730501N20 gene (AK017744), c-myc protein (X010223), ribosomal protein L10A (AK002613), Oct 2b gene (X53654), microlite (AK015601), dihydrolipoamide dihydrogenase (BC003368), tracle (U81030), lysozyme (BC002069), ferritin H chain (BC012314), brevican (X87096), matrix metalloproteinase 12 (BC019135), EIA-stimulated gene cellular inhibitor (AF084524), S100 calcium binding protein A9 (BC027635), MPS1 protein (L20315), transglutaminase 2 (BC016492), serum and glucocorticoid regulated protein kinase (AF139639), RIKEN cDNA 5830413L19 (BC027496), interferon-induced protein (BC003804), milk fat globul membrane protein EGF factor 8 (BC018577), cell-surface glycoprotein p91 (U83172), arginase 1 (BC050005), tumor

necrosis factor receptor 1 (M59378), retinoid-induced
serine carboxypeptidase (AF330052), FLJ11000 homologue
(BC023802), interleukin-18 binding protein d precursor
(AF110803), chloride channel 7 (AK009435), CD36 antigen
5 (BC010262), zink finger protein homologue (BC030186),
carbohydrate binding protein 35 (J03723), C-type calcium
dependent carbohydrate (BC003218), lipoprotein lipase
(NM_008509), v-maf lacertus fibrosarcoma oncogene
(BC038256), interleukin 7 receptor (NM_008372), chemokine
10 (C-C) receptor 1 (BC011092), neurophililine
(MGD|MGI:106206) (AK002673), SERPINA3G (XM_127137), GABA-A
receptor subunit 6 (X51986), LAPtm5 (U51239), G-protein
signal regulator (BC049968), decoy-stimulating factor GPI
fixed mRNA (L41366), Y box protein 3 (AK019465),
15 osteopontin precursor (J04806), amyloid beta (A4)
precursor protein-binding family (AK021331), T cell
receptor beta subunit analogue (U63547), immune related
nucleotide 1 (BC005577), higher stage transcription factor
1 (NM_009480), olfactory receptor MOR267-7 (NM_146714),
20 lymphocyte specific protein tyrosine kinase (M12056),
osteoclast cancer inhibitor (AB013898), platelet active
receptor homologue (BC024054), natural killer cell protein
2-A1 (AF016008), unidentified protein MGC36662 (BC023851),
semaphorin 6A precursor homologue (AK004390),
25 neurofilament homologue polypeptide (BC025872), cornin

homologue actin binding protein 2A (BC026634), solute
transmitting family 6 (BC015245), temporary purine
receptor P2Y10 homologue (AK020001), T cell receptor gamma
chain (X03802), poly A polymerase alpha (NM_011112), OPA-
5 related protein OIP5 analogue (AK017825) and mytogen
activated protein kinase 1 analogue (BC006708).

【Claim 2】

A differentiation regulating agent, which regulates
10 differentiation from stem cells into premature natural
killer cells, containing one or more genes, as an
effective ingredient, selected from a group consisting of
homeobox protein MIX (AF15457), pre-pro-proteinase 3
(U97073), myeloblastosis (Myb) oncogene (M16499), keratin
15 complex 1, acidic, gene 13 (NM_010662), PA-phosphatase
related phosphoesterase (AK002966), gamma-parvin
(BC011200), forkhead-related transcription factor 1C
(AF330105), RIKEN cDNA 5730501N20 gene (AK017744), c-myc
protein (X010223), ribosomal protein L10A (AK002613), Oct
20 2b gene (X53654), microlite (AK015601), dihydrolipoamide
dihydrogenase (BC003368) and tracle (U81030).

【Claim 3】

A differentiation regulating agent, which regulates
25 differentiation from premature natural killer cells into

mature natural killer cells containing one or more genes,
as an effective ingredient, selected from a group
consisting of lysozyme (BC002069), ferritin H chain
(BC012314), brevican (X87096), matrix metalloproteinase 12
5 (BC019135), EIA-stimulated gene cellular inhibitor
(AF084524), S100 calcium binding protein A9 (BC027635),
MPS1 protein (L20315), transglutaminase 2 (BC016492),
serum and glucocorticoid regulated protein kinase
(AF139639), RIKEN cDNA 5830413L19 (BC027496), interferon-
10 induced protein (BC003804), milk fat globul membrane
protein EGF factor 8 (BC018577), cell-surface
glycoprotein p91 (U83172), arginase 1 (BC050005), tumor
necrosis factor receptor 1 (M59378), retinoid-induced
serine carboxypeptidase (AF330052), FLJ11000 homologue
15 (BC023802), interleukin-18 binding protein d precursor
(AF110803), chloride channel 7 (AK009435), CD36 antigen
(BC010262), zink finger protein homologue (BC030186),
carbohydrate binding protein 35 (J03723), C-type calcium
dependent carbohydrate (BC003218), lipoprotein lipase
20 (NM_008509), v-maf lacertus fibrosarcoma oncogene
(BC038256), interleukin 7 receptor (NM_008372), chemokine
(C-C) receptor 1 (BC011092) and neurophilline
(MGD|MGI:106206).

25 **【Claim 4】**

A differentiation regulating agent, which regulates differentiation of mature natural killer cells, containing one or more genes, as an effective ingredient, selected from a group consisting of SERPINA3G (XM_127137), GABA-A
5 receptor subunit 6 (X51986), LAPTm5 (U51239), G-protein signal regulator (BC049968), decoy-stimulating factor GPI fixed mRNA (L41366), Y box protein 3 (AK019465), osteopontin precursor (J04806), amyloid beta (A4) precursor protein-binding family (AK021331), T cell
10 receptor beta subunit analogue (U63547), immune related nucleotide 1 (BC005577), higher stage transcription factor 1 (NM_009480), olfactory receptor MOR267-7 (NM_146714), lymphocyte specific protein tyrosine kinase (M12056), osteoclast cancer inhibitor (AB013898), platelet active
15 receptor homologue (BC024054), natural killer cell protein 2-A1 (AF016008), unidentified protein MGC36662 (BC023851), semaphorin 6A precursor homologue (AK004390), neurofilament homologue polypeptide (BC025872), cornin homologue actin binding protein 2A (BC026634), solute
20 transmitting family 6 (BC015245), temporary purine receptor P2Y10 homologue (AK020001), T cell receptor gamma chain (X03802), poly A polymerase alpha (NM_011112), OPA-related protein OIP5 analogue (AK017825) and mytogen activated protein kinase 1 analogue (BC006708).

【Claim 5】

The differentiation-regulating agent as set forth in anyone of claim 1 to claim 4, wherein the differentiation-regulating agent is used for the treatment of cancer.

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【Claim 6】

The differentiation regulating agent as set forth in claim 5, wherein the cancer is selected from a group consisting of breast cancer, melanoma and lung cancer.

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【Claim 7】

A screening method for a gene regulating the differentiation from stem cells into natural killer cells comprising the following steps:

15 1) Synthesizing cDNA after separating whole RNA from cells;

 2) Separating tag after digesting the cDNA of the step 1;

 3) Connecting each tag separated in the step 2 and then analyzing nucleotide sequence thereof; and

20 4) Quantifying the expression of the gene, based on the analyzed nucleotide sequence above, by using SAGE (Serial Analysis of Gene expression) analyzing program.